

**IN THE CLAIMS:**

Please delete Claims 2-7 canceled in the parent case, and 12-20 allowed in the parent case.

Please amend the following claims:

1.(Currently Amended) A high repetition rate production quality gas discharge laser system with jitter control, said system comprising:

- A) a laser chamber comprising:
  - 1) a laser gas,
  - 2) a pair of elongated electrodes defining a discharge region,
  - 3) a fan for recirculating said laser gas between said electrodes,
  - 4) a heat exchanger for removing heat from said laser gas;
- B) a pulse power system for providing high voltage electrical pulses to produce discharges across said electrodes at repetition rates of 1000 Hz or greater[;]
- C) a controller ~~configured to control~~ means to for controlling jitter of all or substantially all of said discharges to an accuracy of within ~~0.2 10 to 20 ns or less microsecond~~ [; and]
- D) ~~said system comprising a light source for another system.~~

2.(Canceled) A laser system as in Claim 1 wherein said controller is configured to control said timing of an accuracy of within 0.1 microseconds or less.

3. (Canceled) A laser system as in Claim 1 wherein said controller is configured to control said tuning to an accuracy of within 100 to 200 ns or less.

4. (Canceled) A laser system as in Claim1 wherein said controller is configured to control said timing to an accuracy of within 10 to 20 ns or less.

5. (Canceled) A laser system as in Claim 1 wherein said laser chamber is contained in an easily replaceable module.

6. (Canceled) A laser system as in Claim 5 wherein said most of said pulse power system is contained in an easily replaceable module.

7. (Canceled) A laser system as in Claim 6 wherein all or substantially all components of said laser system are contained in easily replaceable modules.

8. (Currently Amended) A laser system as in Claim 1 wherein said laser system is ~~configured to function as~~ a light source in a reticle writing system.

9. (Currently Amended) A laser system as in Claim 1 wherein said laser system is ~~configured to function as~~ a light source [for] [in] a reticle inspection system.

10. (Currently Amended) A laser system as in Claim 1 wherein said laser system is ~~configured to function as~~ a light source [for] [in] a wafer inspection system.

11. (Original) A laser system as in Claim 1 wherein said pulse power system comprises a subcircuit including a peaking capacitor bank and the two electrodes wherein said subcircuit has an inductance of less than 5 nH.

12. (Canceled) A laser system as in Claim 1 wherein said repetition rate is about 2000 Hz or greater.

13. (Canceled) A laser system as in Claim 1 wherein said repetition rate is about 3000 Hz or greater.

14. (Canceled) A laser system as in Claim 1 wherein said repetition rate is about 4000 Hz or greater.

15. (Canceled) A laser system as in Claim 1 wherein said laser gas is comprised of krypton, fluorine, and a buffer gas and said system is configured to produce laser light at wavelengths of about 248 nm.

16. (Canceled) A laser system as in Claim 1 wherein said laser gas is comprised of argon, fluorine and a buffer gas and said system is configured to produce light at wavelengths

at about 193 nm.

17. (Canceled) A laser system as in Claim 1 wherein said laser is comprised of fluorine and a buffer gas and said system is configured to produce light at wavelengths of about 157 nm.

18. (Canceled) A laser system as in Claim 1 wherein said system comprises two mirrors defining a resonant cavity one of said mirrors having high reflectivity at wavelength of laser beams produced by said laser system and the other of said mirrors being a partially reflecting mirror and configured to function as an output coupler, both mirrors being concave mirrors.

19. (Canceled) A laser system as in Claim 18 wherein said partially reflecting mirror has a reflectivity at said wavelengths in the range of 4% to 30%.

20. (Canceled) A laser system as in Claim 18 wherein each of said mirrors has a concave curvature of about 10 meters.

21. (New) A high repetition rate production quality gas discharge laser system with jitter control, said system comprising:

A) a laser chamber comprising:

- 1) a laser gas,
- 2) a pair of elongated electrodes defining a discharge region,
- 3) a fan for recirculating said laser gas between said electrodes,
- 4) a heat exchanger for removing heat from said laser gas;

B) a pulse power system for providing high voltage electrical pulses to produce discharges across said electrodes at repetition rates of 1000 Hz or greater;

C) a controller means for controlling jitter of all or substantially all of said discharges to an accuracy of within 10 to 20 ns or less; and

D) said controller means comprising:

means for adjusting the light delay from input trigger to laser light emission

due to electrical discharge based at least in part upon the temperature of electrical components in the pulse power system.

22.(New) The apparatus of claim 21 further comprising:

the electrical components comprising at least one magnetic circuit element.

23.(New) A high repetition rate production quality gas discharge laser system with jitter control, said system comprising:

A) a laser chamber comprising:

- 1) a laser gas,
- 2) a pair of elongated electrodes defining a discharge region,
- 3) a fan for recirculating said laser gas between said electrodes,
- 4) a heat exchanger for removing heat from said laser gas;

B) a pulse power system for providing high voltage electrical pulses to produce discharges across said electrodes at repetition rates of 1000 Hz or greater;

C) a controller means for controlling jitter of all or substantially all of said discharges to an accuracy of within 10 to 20 ns or less; and

D) said controller means comprising:

means for adjusting the light delay from input trigger to laser light emission due to electrical discharge based at least in part upon the charging voltage of the pulse power system.

24.(New) A high repetition rate production quality gas discharge laser system with jitter control, said system comprising:

A) a laser chamber comprising:

- 1) a laser gas,
- 2) a pair of elongated electrodes defining a discharge region,
- 3) a fan for recirculating said laser gas between said electrodes,
- 4) a heat exchanger for removing heat from said laser gas;

B) a pulse power system for providing high voltage electrical pulses to produce discharges across said electrodes at repetition rates of 1000 Hz or greater;

C) a controller means to for controlling jitter of all or substantially all of said discharges to an accuracy of within 10 to 20 ns or less; and

D) said controller means comprising:  
means for adjusting the light delay from input trigger to laser light emission due to electrical discharge based at least in part upon both the temperature of at least one electrical component in the pulse power system and the charging voltage of the pulse power system.

25.(New) The apparatus of claim 24 further comprising:

the at least one electrical component comprising at least one magnetic circuit element.

26. (New) A high repetition rate production quality gas discharge laser system with jitter control, said system comprising:

A) a laser chamber comprising:

- 1) a laser gas,
- 2) a pair of elongated electrodes defining a discharge region,
- 3) a fan for recirculating said laser gas between said electrodes,
- 4) a heat exchanger for removing heat from said laser gas;

B) a pulse power system for providing high voltage electrical pulses to produce discharges across said electrodes at repetition rates of 1000 Hz or greater;

C) a controller means to for controlling jitter of all or substantially all of said discharges to an accuracy of within 10 to 20 ns or less; and

D) said controller means comprising:  
means for adjusting the light delay from input trigger to laser light emission due to electrical discharge based at least in part upon a charging voltage set for the upcoming discharge and a timing error determined for the just occurred discharge.

27. (New) A high repetition rate production quality gas discharge laser system with jitter control, said system comprising:

A) a laser chamber comprising:

- 1) a laser gas,
- 2) a pair of elongated electrodes defining a discharge region,

- 3) a fan for recirculating said laser gas between said electrodes,
- 4) a heat exchanger for removing heat from said laser gas;
- B) a pulse power system for providing high voltage electrical pulses to produce discharges across said electrodes at repetition rates of 1000 Hz or greater;
- C) a controller means to for controlling jitter of all or substantially all of said discharges to an accuracy of within 10 to 20 ns or less; and
- D) said controller means comprising:
  - means for adjusting the light delay from input trigger to laser light emission due to electrical discharge based at least in part upon a charging voltage set for the upcoming discharge and a timing error determined for the just occurred discharge, or upon the charging voltage in the pulse power system or upon a combination of these, and wherein the degree of adjustment is subject to a weighting factor that varies depending upon whether or not the timing error is outside of the range of 10 to 20 ns.

28.(New) A method of operation of a high repetition rate production quality gas discharge laser system utilizing jitter control, said method comprising:

- A) utilizing a laser gas chamber comprising:
  - 1) a laser gas;
  - 2) a pair of elongated electrodes defining a discharge region;
  - 3) a fan for circulating said laser gas between said electrodes;
  - 4) a heat exchanger for removing heat from said laser gas;
- B) utilizing a pulse power system for providing high voltage electrical pulses to produce discharges across said electrodes at repetition rates of 1000 Hz or greater; and,
- C) utilizing a controller for controlling jitter of all or substantially all of said discharges to an accuracy of within 10 to 20 ns or less.

29.(New) A method of operation of a high repetition rate production quality gas discharge laser system utilizing jitter control, said method comprising:

- A) utilizing a laser gas chamber comprising:
  - 1) a laser gas;
  - 2) a pair of elongated electrodes defining a discharge region;

3) a fan for circulating said laser gas between said electrodes;

4) a heat exchanger for removing heat from said laser gas;

B) utilizing a pulse power system for providing high voltage electrical pulses to produce discharges across said electrodes at repetition rates of 1000 Hz or greater;

D) utilizing a controller for controlling jitter of all or substantially all of said discharges to an accuracy of within 10 to 20 ns or less, by adjusting the light delay from input trigger to laser light emission due to electrical discharge based at least in part upon a charging voltage set for the upcoming discharge and a timing error determined for the just occurred discharge, or upon the charging voltage in the pulse power system or upon a combination of these, and wherein the degree of adjustment is subject to a weighting factor that varies depending upon whether or not the timing error is outside of the range of 10 to 20 ns and,

whereas said laser chamber is contained in an easily replaceable module.

30.(New) A high repetition rate production quality gas discharge laser system with jitter control, said system comprising:

A) a laser chamber comprising:

1) a laser gas,

2) a pair of elongated electrodes defining a discharge region,

3) a fan for recirculating said laser gas between said electrodes,

4) a heat exchanger for removing heat from said laser gas;

B) a pulse power system for providing high voltage electrical pulses to produce discharges across said electrodes at repetition rates of 1000 Hz or greater;

C) a controller means to for controlling jitter of all or substantially all of said discharges to an accuracy of within 10 to 20 ns or less; and

wherein said most of said pulse power system is contained in an easily replaceable module.

31.(New) A high repetition rate production quality gas discharge laser system with

jitter control, said system comprising:

- A) a laser chamber comprising:
    - 1) a laser gas,
    - 2) a pair of elongated electrodes defining a discharge region,
    - 3) a fan for recirculating said laser gas between said electrodes,
    - 4) a heat exchanger for removing heat from said laser gas;
  - B) a pulse power system for providing high voltage electrical pulses to produce discharges across said electrodes at repetition rates of 1000 Hz or greater;
  - C) a controller means to for controlling jitter of all or substantially all of said discharges to an accuracy of within 10 to 20 ns or less; and
- wherein all or substantially all components of said laser system are contained in easily replaceable module.